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ABSTRACT

This paper relates work in the area of pupil growth measures to administrative tasks and decision-making. The topics synthesized include measurement of pupil growth, accountability and evaluation, and personnel systems management. A critical review, analysis and synthesis of pertinent literature is the major source of information, although information from recent experience in development and use of training packages for administrators is also used. Conclusions answer questions of adequacy of pupil growth measures as a basis for making administrative decisions. This should have implications for determining administrative roles and training for such roles. (Author)

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Implications of Pupil Growth Measures for Administrative Action

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The administrator is a peculiar person. We all "know" that, but let me give you my impressions of his peculiarities. He has the responsibility for providing leadership for a group of specialists, each of whom should have more expertise in his specialty than the administrator. Likewise, he has the responsibility for devising a strategy for management that will utilize the most current information regarding national commitments, local idiosyncrasies, curriculum development, theories of learning, and increasingly complex and voluminous results of studies regarding the relationships of process and product variables in various environments. He attempts to devise a strategy that will have some stability over time, knowing all the while that the information he has will change quite rapidly. And he should attempt to do this without seriously entertaining paranoid thoughts that the educational psychologists are conducting conflicting studies simply to confuse him; therefore, he constantly reminds himself that his own experiential data (though not allowing him to attach a probability to it) leads him to believe that they are confused too. Small comfort.

This paper is designed to do the following: (a) present a major theme with regard to the use of research information on the relationship of teaching processes and products, (b) provide some assumptions underlying this major theme, (c) undergird these assumptions with information from the research literature, and (d) present specific implications of these views for administrative practice.

The Theme

Administrators and teachers should use the results of research concerning presage, environmental, process, and product variables as a first estimate of what is likely to result from given procedures for a specific situation.

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Administrators assist teachers in preparing for teaching activities, in collecting information regarding these activities and their results, and in reviewing the results so that new preparations can be made. When preparations are being made, it is profitable to estimate the probable results of certain actions on the basis of inferences from prior correlational or experimental studies; however, though these studies are of major interest, they should not be considered as rules to be followed. Rather, they are first estimates, to be adjusted on the basis of review and evaluation of the results of actions chosen. If change is needed, a study of other research results should assist in making a second estimation of what will likely work.

This theme is based on the idea that the administrator is interested in helping teachers eventually to answer their question, "What works (or produces the results I desire) for me, in my particular situation?" To answer the question involves trying something, documenting precisely what that something was, and specifying what the results were. Note that the question concerning the teacher is not any of the following.

1. What am I going to do? This is a process oriented question, that some curriculum specialists advocate, but it is often answered in terms of the types of activities enjoyed by the teacher or the students. The enjoyment may not be correlated with pupil growth measures.
2. What am I trying to accomplish? The product oriented question has been avoided in the past; answering the question (or even the question of what was accomplished) does not allow either the diagnosis of problems encountered or replication of desirable results.
3. What should I do in the classroom? When this question is answered on the basis of research (in a rule-following procedure) without the adequate follow-up of review and evaluation of results, it is likely to be a very sterile approach.

Would the application of procedures implied in this theme be respectable from a scientific viewpoint, or am I really talking about an artistic effort or the practice of a craft? (I have never been enamoured with many discussions of this topic before, because I am never sure of the distinctions which people make when they use these terms.) I am of the opinion that teaching involves elements of each of them, particularly as viewed by the following comments.

> Even if the present analyses prove not to be viable, they will not be replaced by the old, global, conceptually impossible, complex variables that I see as one reason for the fruitlessness of so much of research on

teaching in the past. Instead, they will be replaced by other analyses of teaching, perhaps even finer analyses, until we get the sets of lawful relationships between variables that will mark the emergence of a scientific basis for the practice of teaching....Eventually, of course, we shall have to put teaching back together again into syntheses that are better than the teaching that goes on now. I think it would be safe to say that there is abundant hope of our being able to develop a scientifically grounded set of answers to every teacher's central question, 'What should I do in the classroom?' (Gage, 1968, 606)

Consider the following two views which contrast with the above:

....laws and facts, even when they are arrived at in genuinely scientific shape, do not yield rules of practice. Their value for educational practice--and all education is a mode of practice, intelligent or accidental and routine--is indirect; it consists in provision of intellectual instrumentalities to be used by the educator....That is, they direct his attention, in both observation and reflection, to conditions and relationships which would otherwise escape him. If we retain the word "rule" at all, we must say that scientific results furnish a rule for the conduct of observations and inquiries, not a rule for overt action. They function not directly with respect to practice and its results, but indirectly, through the medium of an altered mental attitude. (Dewey, 1929, 28,30)

I believe most of us who teach would admit, if pressed, that the majority of our teaching decisions in the classroom are not made on the basis of theoretical considerations at all. Part of this is probably due to the limitations of theory in the behavioral sciences at the immediate decision-making level in the classroom. Human interactions are too rich to be adequately described by behavioral-science theory at its present state of development. As theory grows and as it becomes more complete, we may reach a point at which it may be more useful, but the likelihood of ever obtaining a network of theory adequate for directing all or most human action in the classroom seems to me to be small. (Eisner, 1963, 305)

By way of an additional contrast, the following dialogue between Igor Stravinsky and George Balanchine is interesting:

Stravinsky: How much music will you want for the three dancers' first variation?
Balanchine: Thirty-one seconds, I would think.
Stravinsky: Could you settle for thirty-two?

They were not joking. One reason the late composer Igor Stravinsky and choreographer George Balanchine got on so well was that they both worried about craft at a time when everyone else was worrying about art. If art was the result of their labors, so much the better, but they did not agonize about it. "When I know how long a piece must take, then it excites me." Stravinsky said in explaining the importance of the discipline of limits. To him as to Balanchine, mastery of the work at hand was what counted, not the creation of so-called masterworks. As Balanchine once put it: "If you set out deliberately to make a masterpiece, how will you ever get it finished?"

That masterpieces resulted anyway was amply proved last week as the New York City Ballet staged one of the cultural, or craftsman-like, events of the decade. (Time Magazine, July 3, 1972)

If one views the comments of Cage as being concerned with a science of teaching, those of Dewey and Eisner emphasizing the artistic, and those of Balanchine and Stravinsky (by analogy) exhibiting a concern for craftsmanship, then I would have to think that the theme I am expressing incorporates elements of each. In essence, I would like to see the administrator assisting the teacher in practicing a craft, in an artistic fashion, based on scientific results to date.

Assumptions

What are the assumptions underlying this position? First, the administrator must deal with the reality of the present. He must deal with what IS, which includes teachers, students, parents, expectations, motivations, learning, societal and environmental factors. This reality with which he must interact does not come packaged in the manner he might desire it, nor does it remain static for long periods of time; the reality he faces is dynamic, even if the administrator does not touch it. This is disturbing to some administrators,* since there is a strong desire to make progress by building on the stable conditions of yesterday. The direct implication of this assumption that the administrator must deal with the reality of the present is that he should be able to measure the reality that he faces accurately, expeditiously, and--if possible--economically.

Second, it is assumed that there is a necessity for the administrator to deal with the "realm of possibility" of the future. This "realm of possibility" is what CAN (or probably will) occur. Therefore, the administrator who is interested in improvement (And who could be against that?), should try to change those things that have a high probability of resulting in improvement; but he must deal with what reality is likely to be, not with dreams of what he would like for it to be if he were given perfect conditions. This implies that he should have good hunches regarding what should be changed (given certain desired outcomes), which variables he should try to manipulate, how people are likely to respond.

Third, it is assumed that it is necessary for the administrator to have a system of management that allows him to cope with the results of his own manipulations of the environment. To cope with what happens and to make adjustments

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*Some people view life as lived on level ground, while others realize that it actually is lived on an inclined plane--where you must continually be moving upward to keep up with the traffic, and where things have a tendency to roll backwards when they come to rest.

involves knowing what OUGHT to be occurring in a particular situation; this involves developing an individual and an institutional system of values to determine the oughts, and a system of management to correct errors and to keep the organization on course. On the basis of a knowledge of the situation that exists and a value system that has been developed, a specification of what OUGHT to occur (or what outcomes are desired) is made. On the basis of what he thinks CAN happen, he tries something. On the basis of what DOES happen, he makes an adjustment and recycles. The direct implication of this assumption is that the administrator should develop a reasonable means of determining desirable outcomes and a system of feedback, analysis, interpretation, and decision-making.

Information Relating to the Assumptions

What information is available to the administrator who makes these assumptions? It is recognized that the information cited is not exhaustive, but hopefully it will be beneficial at least in a suggestive sense (suggestive of the type of information that should be collected by the administrator, that is).

Regarding dealing with what IS reality. Situations (including the organizational environment) change over time, and differing situations have a differential impact on the behavior of teachers and the predispositions of students. Teachers behave differently in different situations, change over time, and their effectiveness is not very consistent (Brophy, 1973)(exception: same material, different students, short-term lesson; Rosenshine, 1970). Knowing this, and having the desire to know what reality is like at a given point in time makes the administrator very aware of the need for precise and adequate sampling of data that might be available to him. Not only must he sample (or choose) what domains and variables he wants to measure (and this appears to be related directly to his cue-reduction ability); but he also must acquire the data from a given domain in such a manner that he gets a clear picture of this reality that he faces. I will not deal with this latter sampling question, but I would like to offer some suggestions of categories of information that should assist him in understanding this reality better. Your own analysis or subdivision of reality into component parts may lead you to different categories and measurement procedures, but these appear reasonable to me at present.

1. Environmental variables, including: sociological writings of current scene, personal observations of current scene, parental surveys, measures of organizational environment such as school climate, psychological reports of nature of learning.

2. Personalistic or process variables: observation guides for recording teacher behavior (particularly valuable if they are criterion referenced and low inference), observation guides for recording student behavior during learning activities, feedback from students of their observations of teachers, feedback from teachers of their observations of their own and student behavior.
3. Outcomes or product variables: achievement tests--commercial and teacher made, group referenced and criterion referenced; aptitude tests, affective measures--dealing with interests, attitudes, temperament, preferences, and expectations; and psychomotor tests involving skills developed.

It will be noted that a number of these variables do not deal with pupil growth measures. However, the theme of this paper implies that the administrator cannot deal with pupil growth measures in isolation from other variables with which he must contend; consequently, the need for the measurement of other variables in order to understand fully the reality with which he interacts.

Regarding dealing with what CAN occur. Although the administrator's ego tells him that teachers should behave very similarly to the way that he behaved in the classroom, and his high value for parsimony causes him to desire only a very limited number of ways of accomplishing goals, in the depth of his mind is a full realization that different processes can produce the same results. Research results would lead one to the same conclusion; we have many more "contributory" variables than either "necessary" or "sufficient" variables.

And these contributory variables exist on different levels. For example, some research regarding student growth has been concerned with macro variables. In this regard, (a) schools do appear to make a difference, in that older students score better on achievement, (b) the socio-economic background of students is one of the better predictors of achievement, (c) learning is differential by subject matter and is sometimes sex linked, and (d) learning in some areas is related to the national and societal commitment to learning in those areas. (Featherstone, 1974)

On more of a middle range of specificity, it appears that certain organizational variables of schools (e.g., size of class or school, whether the school is "open" or graded) have very little impact on cognitive achievement. (Platt, 1974)

Many administrators are concerned with the implications of the macro and the middle range variables; however, there probably is greater interest in more

specific or micro variables. And it is here that we have more extensive research results, some of which give the administrator relatively good cues to first estimates of what might be tried in the classroom. Recent reviews (Rosenshine, 1971; Rosenshine and Furst, 1973) indicate that the following appear to have the most promise because of their relationship to pupil growth in achievement:

1. Clarity of expression; very consistent positive correlation.
2. Use of variety of instructional materials and procedures; positive correlation.
3. Enthusiasm; significant and consistent positive relationship.
4. Achievement-oriented and business-like manner; consistent positive trend.
5. Teacher criticism of students; significant negative relationship between strong criticism and achievement, mixed trend with mild criticism with some positive relationships.
6. Teacher indirectness and use of student ideas; consistent positive relationship, not all of which were significant.
7. Opportunity to learn the criterion material; positive significant relationship.
8. Use of structuring comments; large number of significant positive results.
9. Use of higher level questions; significant differences in experimental groups (Gall, 1970)

It is perhaps surprising and disconcerting to some that such variables as non-verbal approval, praise, warmth, I/D ratio, student talk, student participation have not been shown to be significantly and/or consistently related to pupil growth. Two comments may be in order here. First, these non-significant relationships should serve as a warning to administrators not to mistake pupil happiness with instruction, the general popularity of a teacher, or busyness (active involvement) of students as true indications that achievement or changes of attitude are occurring. Second, since most of the correlational and experimental studies have been done over periods of one school year or less, we do not have much information regarding how these indicators relate to later learning and attitudes toward learning. For example, consider both short-term and long-term learning in both the cognitive and the affective domains:

	cognitive	affective
short-term	1	2
long-term	3	4

Pupil growth in cell 2 may promote a gain in cell 3 or 4, even though no gain occurs in cell 1. Likewise, a gain in cell 1 with negative results in cell 2 may decrease pupil growth in both cell 3 and cell 4. Although considerable resources would be needed to test such a hypothesis on a large-scale basis, an administrator should be able to determine what results are obtained on a local level with reasonable use of resources. In effect, it seems important to me that administrators assist teachers in clarifying their hypotheses with relation to these cells and acquiring information about results.

Some people express concern because many of the research results that we have are correlational rather than experimental, because we cannot pinpoint the precise cause of learning and attribute specific results to the actions of a particular teacher. However, I would argue that school learning always occurs in a diseased environment rather than an antiseptic one; that, in fact, learning occurs in any situation because of an interaction effect of teacher behavior and extraneous situational factors. Therefore, one is not so concerned with whether the teacher behavior in and of itself caused the results as the fact that the teacher behavior in conjunction with other variables in operation in the situation caused pupil growth to occur. This point of view emphasizes the idea that either experimental or correlational information which expresses relationships between procedures of teachers and pupil growth measures may be beneficial in estimating what initial procedures should be tried in specific local situations.

Other information that appears to have relevance to the general theme of this paper, and to relate to what CAN occur, is that within certain subject matter areas certain methods affect different subgroups differentially. (Berliner & Cahen, 1973) Although the research evidence regarding trait-treatment interaction is not as fruitful as one might hope in view of the emphasis on individualization of instruction that we have seen in recent years, it is sufficiently strong to support the view that administrators should assist teachers in formulating hunches regarding what is most likely to occur with different types of students and then checking to see if the different procedures are effective in the manner hypothesized.

Regarding coping with manipulations. What information does the administrator have available that will allow him and the teacher to deal with what DID happen after certain procedures were tried? First, he has available all of the measurement capabilities that help him to describe the reality he faces. Measurement of these variables will help him to know relationships among process-product variables for

his specific situation. As he examines such measures, he will become very aware that certain information is of very little value to him and the teacher in making plans for the next cycle of activities. For example, it does little good to know grade placement scores or mean scores on criterion tests. What is beneficial is to know which desired outcomes were achieved and which were not--and by which subgroups of students. And, he also needs to know what specific teacher behaviors were used. This information allows him to determine whether the procedures planned were actually implemented (procedures are often condemned for not acquiring desired results--when the real problem is that the procedures were not fully implemented), whether the results were satisfactory, and whether the procedures should be replicated or modified. The important consideration to the administrator is whether the feedback he helps to provide and analyze contributes to decisions which need to be made by the teacher.

If it is decided that the procedures did not produce the desired results, then the administrator returns to the information base regarding what CAN occur to acquire what might be considered to be the next-best hunches regarding what procedures to use. If the planning-collecting information-reviewing results cycle is relatively short, corrective action prevents serious errors from creeping into the instructional system.

In addition, the administrator needs good analytical and decision tools to manage the information regarding processes used and results obtained. His basic analytical tools are those of subdivision of information into fine enough parts to be psychologically meaningful, and statistical techniques that will allow him to discuss clusterings of data. Where processes are found not to have been implemented as planned, he needs access to control mechanisms which improve that implementation. To utilize the information adequately, he needs communication skills that will facilitate acceptance of the feedback that has been analyzed and interpreted.

Specific Implications

What are the specific implications of (a) the general theme that administrators and teachers should use research information as a first estimate of what is likely to result from given procedures in a specific situation, and (b) the assumptions that an administrator must be able to deal with the reality of the present, to plan for what can happen in the future, and to cope with manipulations of the teaching environment?

1. Generally, teachers should be selected for their adaptability, their capability of solving problems that arise on the job, their enthusiasm for the task at hand, their ability to explain ideas clearly, and their task orientation and desire to produce results. These attributes appear to be less susceptible to training, yet do appear to have a reasonable linkage to pupil growth in a variety of situations.
2. Generally, preservice or inservice training should be provided to develop the information base, the attitude, and the skill to use a variety of instructional procedures and materials, to use criticism judiciously and selectively, to be indirect in approach to the extent of using comments and ideas of students, to structure lessons by providing advance organizers and lucid summaries, and to use feedback for modifying instructional procedures.
3. Since information available regarding pupil growth research is such that we do not have general and lawful relationships between teacher processes and pupil growth, administrators should not evaluate teachers on the basis of procedures alone. To treat process, e.g., the use of discovery procedures or multi-sensory approaches, as the most important criterion for evaluation (and subsequent supervision) is to ignore the impact of intervening variables in specific situations. If one looks only at the process side of the process-product relationship, he does not know what CAN happen--he merely knows the procedure used rather than whether or not it worked in the manner desired. A related implication is that to examine pupil growth without collecting information regarding procedures used prevents one from diagnosing difficulties or replicating processes.
4. It takes time and skill to operate in the manner I have been describing. Therefore, the administrator should be trained to observe, analyze, and communicate. In addition, the administrator should be able to conceptualize the distinction between evaluation and supervision--and should design an individualized supervision based on information from the evaluation process. This implies that administrators should do something that a large number of them do not do, viz., integrate evaluation into their management or supervisory style.

Concluding Comments

Which brings us back to the basic theme of the paper, viz., that it makes sense for administrators and teachers to adopt a strategy that uses research findings regarding pupil growth as an initial estimate of what activities are likely to produce best results in a given situation--but currently should not consider the research results as general rules to follow. If this strategy is followed, administrators and teachers will begin to use observational systems to test hypotheses in local situations, rather than simply to document desired behavior (which Rosenshine and Furst, 1973, indicate appears to be the more prevalent practice). Likewise, the strategy will have the potential durability for surviving over time, since it has a built-in capability for evaluating the local impact on pupil growth of research done in very limited situations--but advocated for general adoption prior to conducting research in normal classroom situations.

The strategy appears to be compatible with the scientist and to use his research results for making first estimates. It can use the creative talents of the artistic teacher who has insight into the optimum blend of activities for a particular group of pupils, and it requires the execution of well developed craftsman skills. The use of such a strategy may not make the administrator any less peculiar, but perhaps his peculiar peculiarities will be accepted and understood by both the research psychologist and the classroom teacher.

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